



NAREL ANALYTICAL REQUEST FORM

This form must be completed at least 14 days before sending any samples to NAREL for analysis. The requester is to complete all fields highlighted in **BLUE** and e-mail the form to Tonya Hudson ([[HYPERLINK](#)

"mailto:hudson.tonya@epa.gov"]) along with an electronic copy of the project's QA Plan and detailed site and project description (required).

Requester:	Dante Rodriguez		Request Date: 5/22/2019									
Title:	Remedial Project Manager		Office/Region: 9									
Address	75 Hawthorne Street, SFD-8-2 San Francisco, CA 94105											
Phone:	(415) 972-3166		FAX: N/A									
E-mail:	rodriguez.dante@epa.gov											
<p align="center">PROJECT INFORMATION (REQUIRED)</p> <p>Please provide or attach a detailed site and project description including known or suspected hazards. If one is not attached or included, this request will be returned.</p> <p>Hunters Point Naval Shipyard in San Francisco, California, was the site of radiological experiments after World War 2, including attempts to decontaminate radiologically contaminated ships from Operation Crossroads and experiments on equipment and animals to test the effects of radiation. Liquid radiological wastes were discharged to storm drains and sewers and stored in underground tanks. Radiological objects were also manufactured on site as well as discarded and buried on site.</p> <p>Radiological surveys and remediation were previously conducted, but an independent third-party evaluation of the data identified data manipulation, falsification and other quality issues with data collected by the Navy's contractor. As a result, the Navy developed a plan with a new contractor to reinvestigate the site.</p> <p>As part of the reinvestigation, a sampling effort is planned by the Navy focused on obtaining data to calculate soil background values, for which EPA will conduct field oversight and split sampling. The radionuclides of concern are Cs-137, Pu-239, Ra-226, Sr-90, Th-232, and U-235+D.</p>												
Site Name and location: Hunters Point Naval Shipyard, San Francisco, CA												
Site Program Type: <input type="checkbox"/> Regional <input type="checkbox"/> Superfund <input type="checkbox"/> Other <input type="checkbox"/> Federal Facility												
Expected Arrival Date at NAREL: 7/21/19		Does Project Have a QAPP: Yes <input type="checkbox"/> No <input type="checkbox"/>										
Number of Samples and Matrices:	Soil 25	Sediment <input type="checkbox"/>	Water <input type="checkbox"/>	Air Filter <input type="checkbox"/> Vegetation <input type="checkbox"/> Other <input type="checkbox"/>								
<p align="center">PROJECT SPECIFIC REQUIREMENTS</p> <p>For requirements other than NAREL standards, an Analytical Protocol Specification (APS) form must be completed.</p>												
Specialized Handling: <input type="checkbox"/> Radiochemicals <input type="checkbox"/> Hazardous Chemicals <input type="checkbox"/> Biohazards <input type="checkbox"/> Other <input type="checkbox"/>												
Sample Preparation: <input type="checkbox"/> NAREL Standard <input type="checkbox"/> Other <input type="checkbox"/>												
Quality Control: <input type="checkbox"/> NAREL Standard <input type="checkbox"/> Other <input type="checkbox"/>												
Turnaround Time: <input type="checkbox"/> NAREL Standard <input type="checkbox"/> Other <input type="checkbox"/>												
Data Reporting: <input type="checkbox"/> NAREL Standard <input type="checkbox"/> Other <input type="checkbox"/>												
MDCs & RLs: <input type="checkbox"/> NAREL Standard <input type="checkbox"/> Other <input type="checkbox"/>												
<p align="center">NAREL ANALYTICAL SERVICES</p> <table border="1"> <thead> <tr> <th>Analysis</th> <th>Check Box</th> <th>Analysis</th> <th>Check Box</th> </tr> </thead> <tbody> <tr> <td>Gamma Spectrometry</td> <td><input type="checkbox"/></td> <td>Americium</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>					Analysis	Check Box	Analysis	Check Box	Gamma Spectrometry	<input type="checkbox"/>	Americium	<input type="checkbox"/>
Analysis	Check Box	Analysis	Check Box									
Gamma Spectrometry	<input type="checkbox"/>	Americium	<input type="checkbox"/>									

Gamma Spectrometry (21-day ingrowth)	[FORMCHECKBOX]	Plutonium	[FORMCHECKBOX]
Gross Alpha/Beta (water only)	[FORMCHECKBOX]	Uranium	[FORMCHECKBOX]
Tritium (water only)	[FORMCHECKBOX]	Thorium	[FORMCHECKBOX]
Iodine-131 (water only)	[FORMCHECKBOX]		
Strontium (water only)	[FORMCHECKBOX]		
Radium-226	[FORMCHECKBOX]		
Radium-228 (available by gamma only)	[FORMCHECKBOX]		

ATTACHMENT 1

NAREL STANDARD SAMPLE PREPARATION

Liquid samples are checked for pH and adjusted if necessary. Otherwise liquid samples are analyzed as received.

Solid samples are dried and ashed for all analyses except gamma which uses the dried portion. If only gamma and gross alpha and beta analyses are requested, then samples are only dried for analysis. Foreign materials such as rocks, sticks, leaves, etc. are removed before ashing.

Filter preparation is based on filter type, size, and requested analysis. Filters may be analyzed as received or may be dissolved prior to analysis.

NAREL STANDARD QUALITY CONTROL INFORMATION

Standard QC analyses at NAREL are performed on batches of up to 20 samples of similar matrices. The QC analyses include:

Method	Method blank	LCS	Replicates	Matrix spike
Gross α/β for air filters			X	
Gross α/β for water	X	X	X	X
Gross α/β for other matrices	X	X	X	
Gamma-ray spectrometry	X	X	X	
Tritium in water	X	X	X	X
Actinides	X	X	X	
Radium-226	X	X	X	
Radium-228	X	X	X	X
Strontium	X	X	X	
Iodine-131	X	X	X	
Metals	X	X	X	X

Note: For analyses requiring duplicate (replicate) and matrix spike analyses, a sufficient amount of sample must be received. The sample-duplicate combination and the sample-matrix spike combination can be performed on two different samples, e.g., one will be split and duplicated, the second will be split and spiked, or on one sample if at least three volumes of sample are received.

NAREL STANDARD TURNAROUND TIMES

Turnaround time for all analyses except Radium-226 is 60 calendar days from receipt of sample(s) unless other arrangements are made before NAREL accepts the project. Radium-226 may require 10 *additional* days to complete.

Large numbers of samples, especially soil or solids, received at the same time may require longer turnaround times due to the sample prep required before analysis.

NAREL STANDARD DATA REPORTING

The NAREL standard data deliverable includes sample and QC results. Results will be reported as pCi/g (dry) for solids, pCi/L for liquids, and pCi/m³ for air filters. Results for hazardous waste analyses will be reported as $\mu\text{g/L}$ for liquids and mg/kg for soils. An electronic file (pdf) of the data report will be sent to the requester along with an electronic data deliverable (EDD). A hard copy of the report is available upon request.

NAREL STANDARD SAMPLE DISPOSAL

NAREL will dispose of liquid samples and return solid samples to the requester six months after delivery of the data package(s).

ATTACHMENT 1

NAREL STANDARD MDCs & RLs

Standard MDCs and reporting limits are listed in the tables below. MDCs and Reporting Limits depend on a number of variables including sample size, counting times, instrument backgrounds, matrix interferences, dilutions, etc. The actual MDC and Reporting Limit for each sample will be different from those listed below based on each of these variables.

RADIOCHEMICAL MDCs

Analysis Type	Drinking Water Aliquot Size	Drinking Water MDC*	Water (other) Aliquot Size	Water (other) MDC	Solids Aliquot Size	Solids MDC	Air Aliquot Size	Air MDC*
Gross Alpha	500 mL	1.8 pCi/L	200 mL	4.4 pCi/L	0.1 g	8.7 pCi/g		
Gross Beta	500 mL	1.4 pCi/L	200 mL	3.5 pCi/L	0.1 g	7 pCi/g	2500 m ³	0.0006 pCi/m ³
Radium-226			200 mL	0.4 pCi/L	0.25 g	0.4 pCi/g		
Radium-228			1 L	1 pCi/L	0.5 g	2 pCi/g		
Iodine-131			2 L	0.7 pCi/L				
Strontium-89			1 L	2 pCi/L	0.5 g	4 pCi/g		
Strontium-90			1 L	2 pCi/L	0.5 g	4 pCi/g		
Americium-241			200 mL	0.3 pCi/L	0.5 g	0.15 pCi/g		
Plutonium-238, 239			200 mL	0.3 pCi/L	0.5 g	0.15 pCi/g	10000 m ³	6 x 10 ⁻⁶ pCi/m ³
Uranium- 234, 235, 238			200 mL	0.4 pCi/L	0.5 g	0.2 pCi/g	10000 m ³	8 x 10 ⁻⁶ pCi/m ³
Thorium-232, 228			200 mL	0.4 pCi/L	0.5 g	0.15 pCi/g		
Thorium-230			200 mL	0.5 pCi/L	0.5 g	0.2 pCi/g		
Thorium-227			200 mL	0.7 pCi/L	0.5 g	0.3 pCi/g		
Tritium			10 mL	0.1 nCi/L				

* Drinking water and air MDCs are only listed for RadNet samples. Call the Analytical Services Coordinator at 334-270-3433 for MDCs on other radionuclides in drinking water and air.

INORGANIC METALS REPORTING LIMITS

Analyte	Water Reporting Limit	Soil / Sediment Reporting Limit	Analyte	Water Reporting Limit	Soil / Sediment Reporting Limit
Aluminum	40 µg/L	4 mg/kg	Magnesium	100 µg/L	10 mg/kg
Antimony	1 µg/L	0.1 mg/kg	Manganese	1 µg/L	0.1 mg/kg
Arsenic	1 µg/L	0.1 mg/kg	Nickel	1 µg/L	0.1 mg/kg
Barium	1 µg/L	20 mg/kg	Potassium	100 µg/L	10 mg/kg
Beryllium	1 µg/L	0.1 mg/kg	Selenium	1 µg/L	0.1 mg/kg
Cadmium	1 µg/L	0.1 mg/kg	Silver	1 µg/L	0.1 mg/kg
Calcium	200 µg/L	20 mg/kg	Sodium	100 µg/L	10 mg/kg
Chromium	1 µg/L	0.1 mg/kg	Thallium	1 µg/L	0.1 mg/kg
Cobalt	1 µg/L	0.1 mg/kg	Vanadium	1 µg/L	0.1 mg/kg
Copper	1 µg/L	0.1 mg/kg	Zinc	5 µg/L	0.5 mg/kg
Iron	100 µg/L	10 mg/kg			
Lead	1 µg/L	0.1 mg/kg			

ATTACHMENT 2

Analytical Protocol Specification (APS)

Please complete the APS for any project specific requirements where the NAREL standards listed above do not meet those required by the project's QA plan. More than one APS may be necessary to cover all requirements. NAREL will respond if requirements cannot be met by offering alternatives to the requirements which will be described on an Analytical Protocol Specification Alternate Proposal (APSAP) form and attached to the Project Acceptance Form (PAF). The PAF and any APSAP forms will be sent to the requester for signatures indicating acceptance of the data delivery dates and any proposed alternatives.

Site/Project Name: _____

Analyte list: _____ Analysis restrictions: _____

Matrix: _____ Possible interferences: _____

Concentration range: _____ Action level: _____

MQOs

Analytical QC

Batch size: <input type="checkbox"/> 20 samples <input type="checkbox"/> Other _____		
QC Sample Type	Frequency	Evaluation Criteria
<input type="checkbox"/> Method blank		
<input type="checkbox"/> Duplicate		
<input type="checkbox"/> Laboratory control sample		
<input type="checkbox"/> Matrix spike		
<input type="checkbox"/> Matrix spike duplicate		

Analytical Process Requirements

Activity	Special Requirements
Sample receipt and inspection	
Laboratory sample preparation	
Sample dissolution	
Chemical separations	
Preparing sources for counting	
Nuclear counting	
Data reduction and reporting	
Sample disposal	
Other	

Turnaround Time Requirements

Analysis	Special Requirements

Other requirement not listed above: _____

Requester's signature: _____ Date: _____

ATTACHMENT 3

NAREL SAMPLE SHIPMENT GUIDELINES

This document provides guidance in the shipment of environmental samples to NAREL for radiochemical and/or hazardous chemical (metals only) analyses.

All shipments must comply with the requirements of current DOT regulations. Refer to the DOT Hazardous Materials Regulations contained in Title 49 CFR Subtitle B, Chapter 1, Subchapter C, Parts 171 through 180.

Before collecting samples please refer to the attached table for requested sample sizes, containers and preservatives. For matrices not listed, contact the NAREL Analytical Services Coordinator at (334)270-3433.

Before shipping samples, notify the NAREL Analytical Services Coordinator at (334)270-3433 and arrange for sample receipt and subsequent sample return 6 months after results have been reported.

When packing samples for shipment:

- Seal individual samples in plastic bags, preferably ziplock bags.
- Use the correct amount of absorbent material for the volume present. Approved absorbent materials include vermiculite and cat litter.
- Ice is not required for radiochemical or metals analyses, however, if vegetables, fruit, fish, or similar matrices are shipped, ice is required to maintain the integrity of the samples. If possible, maintain the temperature of samples requiring refrigeration during transport at or below 6°C. Ice in a sealed plastic bag or reusable ice substitute freeze packs are acceptable cooling media.
- Chain of Custody forms MUST be sealed in a large ziplock bag and taped to the inside of the cooler lid.

After samples are packed for shipment, secure the cooler with strapping tape and attach a custody seal (if available) across the seam of the cooler lid.

All samples MUST be shipped overnight to arrive Monday through Friday. No deliveries are accepted on weekends or Federal holidays.

Send all samples to:

**Tonya Hudson
Analytical Services Coordinator
National Analytical Radiation Environmental Laboratory
540 South Morris Avenue
Montgomery, Alabama 36115
(334) 270-3433**

ATTACHMENT 4

SAMPLE COLLECTION AND ANALYSIS INFORMATION

	Water Samples				Soil / Sediment Samples			
Analysis	Collection Volume	Acceptable Containers	Preservative	Holding Times	Collection Volume (g)	Acceptable Containers	Preservative	Holding Times
Metals (except mercury)	600 mL	Plastic	HNO ₃ to pH <2	6 months	200 g	Plastic	None	6 months
Tritium	200 mL	Preferably glass bottles with Teflon lined caps, but plastic bottles are an acceptable alternative.	None NO ACID	NA				
Other Radiochemical Analyses	4 L*	Plastic	HNO ₃ to pH <2	NA	~ 500 g	Preferably ziplock bags, but plastic containers are an acceptable alternative.	None	NA

* If multiple analyses are requested, please provide sufficient volume to allow for a dedicated gamma analysis aliquot.
Call the Analytical Services Coordinator at 334-270-3433 for further instructions if needed.